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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,752	06/27/2003	Yong Sung Ham	049128-5110	5560

9629 7590 08/12/2005

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EXAMINER	
SHERMAN, STEPHEN G	
ART UNIT	**PAPER NUMBER**
2674	

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/606,752	HAM ET AL.	
	Examiner	Art Unit	
	Stephen G. Sherman	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Page 20, 1st sentence it states: "...table of FIG. 3 by way of taking one out of tow identical..." The examiner suggests the following correction: "...table of FIG. 3 by way of taking one out of two identical..."

No reference in the specification is made to items S4 and S5 of Figure 7.

Page 23, 1st sentence references bit converter 89A, which is not found in Figure 8. Instead a bit converter 84A is found. The examiner suggests re-labeling item 84A to be item 89A.

No reference in the specification is made to item 90 of Figure 8.

Page 33, 2nd paragraph last sentence reference is made to a lookup table 102, which is not found in figure 11. Instead a lookup table 112 is found. The examiner suggests changing 102 to 112.

Page 40, 2nd paragraph, 1st sentence refers to a liquid crystal display panel 157, data lines 155 and gate lines 156, gate driver 154, timing controller 151, first and second frames memories 158 and 159, input 160, and data driver 153 all of which are not found in figure 15. Figure 15 shows a liquid crystal display panel 57, data lines 55 and gate lines 56, gate driver 54, timing controller 51, first and second frames memories 58 and 59, input 60, and data driver 53.

Page 43, 2nd paragraph refers to a timing controller 151, control signal generator 161, and a lookup table 162 all of which are not found in Figure 16. Figure 16 shows a timing controller 51, control signal generator 161, and a lookup table 162.

Page 46, 1st paragraph refers to an input line 260 in Figure 18 which is not found.

Page 49, 1st paragraph refers to the data driver 153 which is not found in Figure 19. Figure 19 shows data driver 253.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicants' APA, in view of Morita (US 2002/0196221).

Regarding claim 1, APA discloses a method for driving a liquid crystal display, comprising the steps of: receiving source data (Figure 4, Data in); comparing source data of a previous frame with the source data of a current frame to select a preset modulated data in accordance with the result of the comparison (Figure 4, Fn and F_{n-1} and page 5, paragraph [0010], 2nd sentence); and modulating the source data by using the selected modulated data (Figure 4, Mdata Out). The APA fails to teach of reducing the number of bits of the source data, thereby generating a reduced-bit source data. Morita teaches of reducing the number of bits of the source data, thereby generating a reduced-bit source data (Page 2, paragraph [0022]). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to create a liquid crystal display driving method that would not cause deterioration in picture quality but would also reduce the memory of the lookup table.

Regarding claim 2, APA and Morita disclose the method of claim 1. Morita also discloses wherein the selected modulated data is set to be a minimum value within a data band that includes a plurality of initial modulated data, wherein each of the initial modulated data is larger than a current data value of the current frame, when the current data value of the current frame is larger than a previous data value of a previous frame (Page 2, paragraph [0031]. The examiner interprets the lookup table of consisting of initial modulated data and that a value larger than the current data value (first input data) could be chosen from this table when the current data is larger than the previous data (second input data) and that in selecting this data, since overshooting is being performed, that it would be logical for the value in the data band that would be selected

would be the minimum value because all of the values are larger than that of the current value and the next highest number would be the minimum.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the optimization of display characteristics.

Regarding claim 3, APA and Morita disclose the method of claim 1. Morita also discloses wherein the selected modulated data is set to be a maximum value within a data band that includes a plurality of initial modulated data, wherein each of the initial modulated data is smaller than a current data value of the current frame, when the current data value of the current frame is smaller than a previous data value of a previous frame (Page 2, paragraph [0031]. The examiner interprets the lookup table of consisting of initial modulated data and that a value smaller than the current data value (first input data) could be chosen from this table when the current data is smaller than the previous data (second input data) and that in selecting this data, since overshooting is being performed, that it would be logical for the value in the data band that would be selected would be the maximum value because all of the values are smaller than that of the current value and the next lowest number would be the maximum.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the optimization of display characteristics.

Regarding claim 4, APA and Morita disclose the method of claim 1. Morita also discloses wherein the source data is modulated to a current data value of the current frame, in the step of modulating the source data, when the current data value of a current frame is the same as a previous data value of the previous frame (Page 1,

paragraph [0012] where it states: "That is, the lookup table 103 is set a value, in advance, so that, when a gray-scale value of an input 1 is equal to a gray-scale of an input 2, the gray-scale value is output as an output 2..." The examiner interprets input 1 and 2 to be the current and previous frame data and that when these values are equal the lookup table is bypassed.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow the display to maintain the current settings when no change has been detected within the system.

Regarding claim 5, APA and Morita disclose the method of claim 1. Morita also discloses the method of claim 1 further comprising the step of delaying the reduced-bit source data by one frame interval (Page 2, paragraph [0023]). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the comparison between the current and previous frame value.

Regarding claim 6, APA and Morita disclose the method of claim 5. APA and Morita fail to disclose wherein the source data is an 8-bît data, and the reduced-bit source data is a 7-bit data. However, it would have been obvious to "one of ordinary skill" in the art to make the source data 8 bits and the reduced source data 7 bits in order to save memory space by allowing for a smaller lookup table.

Regarding claim 7, APA discloses a method for driving a liquid crystal display, comprising: the first and second data being the current and previous frame data values (Page 5, paragraph [0010]). APA fails to teach a method for driving a liquid crystal

display, comprising: setting a first modulated data that has a larger value than a data value in accordance with an increase of the data value; setting a second modulated data that has a smaller value than the data value in accordance with a decrease of the data value; storing in a storage memory an n-bit source data; wherein n is a positive integer; determining whether a source data of a first data is identical in n-k bits to a source data of a second data stored in the storage memory; wherein k is a positive integer less than n; and supplying the source data of a first data to a liquid crystal display panel or modulating the source data by using the first and second modulated data in accordance with a result of the judging step. Morita discloses a method for driving a liquid crystal display, comprising: setting a first modulated data that has a larger value than a data value in accordance with an increase of the data value (Page 2, paragraph [0031]. The examiner interprets that the value chosen by the lookup table that is larger than the data value would be a first modulated value.); setting a second modulated data that has a smaller value than the data value in accordance with a decrease of the data value (Page 2, paragraph [0031]. The examiner interprets that the value chosen by the lookup table that is smaller than the data value would be a second modulated data.); storing in a storage memory an n-bit source data (Page 2, paragraph [0023]), wherein n is a positive integer; determining whether a source data of a first data is identical in n-k bits to a source data of a second data stored in the storage memory (Page 1, paragraph [0012] where it states: "That is, the lookup table 103 is set a value, in advance, so that, when a gray-scale value of an input 1 is equal to a gray-scale of an input 2, the gray-scale value is output as an output 2..."), wherein k is a positive integer

less than n (Page 2, paragraph [0027]. The examiner interprets this to mean that since the first input is made up of 8 bits such that n=8 and k=1.); and supplying the source data of a first data to a liquid crystal display panel or modulating the source data by using the first and second modulated data in accordance with a result of the judging step (Page 2, paragraph [0024]. The examiner interprets the lookup table as being the judging step which supplies the source data or modulating data based on whether the values are smaller, larger or equal as stated in paragraph [0031] on page 2.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to create a driving method that could determine whether a value has changed and whether an increase or decrease of that value should be made appropriately such that the picture quality will be improved.

Regarding claim 8, APA and Morita disclose the method of claim 7. Morita also discloses wherein n is 8 and k is 1 (Page 2, paragraph [0027]. The examiner interprets this to mean that since the first input is made up of 8 bits such that n=8 and k=1.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to provide a source data that consists of 8 bits.

Regarding claim 9, APA and Morita disclose the method of claim 7. Morita also discloses wherein the supplying the source data includes: supplying the source data of the current frame to the liquid crystal display panel, when the source data value of the current frame identical to the source data value of the previous frame (Page 1, paragraph [0012] where it states: "That is, the lookup table 103 is set a value, in advance, so that, when a gray-scale value of an input 1 is equal to a gray-scale of an

input 2, the gray-scale value is output as an output 2..."); and comparing n-k bits from the source data of the current frame with corresponding n-k bits from the previous frame wherein k is a positive integer less than n, to modulate the source data by using the first and second modulated data, when the source data value of the current frame differs from the source data value of the previous frame (Page 1, paragraph [0012] where it states: "...however, when a gray-scale value of the input 2 is smaller than a grayscale of the input 1, an output 2 having a gray-scale value being larger than a gray-scale value of an input 2 is output as an overshooting gray-scale value and, when a gray-scale value of an input 2 is larger than a gray-scale value of an input 1, and output 2 having a gray-scale value being smaller than a gray-scale value of the input 2 is output as an overshooting gray-scale value." The examiner interprets this to mean that the output 2 in both cases are the first and second modulated data which are used when the two values are different, being larger or smaller.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to create a driving method that will reduce memory and improve picture quality.

Regarding claim 10, APA and Morita disclose the method of claim 9. Morita also discloses wherein modulating the source data includes: modulating the source data by using the first modulated data, when the source data value of the current frame is larger than the source data value of the previous frame (Page 1, paragraph [0012]); and modulating the source data by using the second modulated data, when the source data value of the current frame is smaller than the source data value of the previous frame (Page 1, paragraph [0012]). Therefore it would have been obvious to "one of ordinary

skill" in the art to combine the teachings of APA and Morita in order to create a driving method that will reduce memory and improve picture quality by allowing for an increase or decrease of the modulated data based upon an increase or decrease in the comparison between the previous frame and current frame.

Regarding claim 11, APA discloses an apparatus for driving a liquid crystal display, comprising: an input line for receiving source data (Figure 4, Data in); and a modulator for comparing the source data of a current frame with the source data of a previous frame to modulate the source data by using a preset modulated data in accordance with a result of the comparison (Figure 4, Fn and F_{n-1} and page 5, paragraph [0010], 2nd sentence). APA fails to teach of a bit converter for reducing the number of bits of the received source data to generate reduced bit source data. Morita discloses a bit converter for reducing the number of bits of the received source data to generate reduced bit source data (Page 2, paragraph [0023]). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to create a liquid crystal display driving apparatus that would not cause deterioration in picture quality but would also reduce the memory of the lookup table.

Regarding claim 12, APA and Morita disclose the apparatus of claim 11. Morita also discloses wherein the selected modulated data is set to be a minimum value within a data band that includes a plurality of initial modulated data, and each of the initial modulated data is larger than a current data value of the current frame, when the current data value of the current frame is larger than a previous data value of the previous frame (Page 2, paragraph [0031]. The examiner interprets the lookup table of

consisting of initial modulated data and that a value larger than the current data value (first input data) could be chosen from this table when the current data is larger than the previous data (second input data) and that in selecting this data, since overshooting is being performed, that it would be logical for the value in the data band that would be selected would be the minimum value because all of the values are larger than that of the current value and the next highest number would be the minimum.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the optimization of display characteristics.

Regarding claim 13, APA and Morita disclose the apparatus of claim 11. Morita also discloses wherein the selected modulated data is set to be a maximum value within a data band that includes a plurality of initial modulated data, and each of the initial modulated data is smaller than a current data value of the current frame, when the current data value of the current frame is smaller than a previous data value of the previous frame (Page 2, paragraph [0031]. The examiner interprets the lookup table of consisting of initial modulated data and that a value smaller than the current data value (first input data) could be chosen from this table when the current data is smaller than the previous data (second input data) and that in selecting this data, since overshooting is being performed, that it would be logical for the value in the data band that would be selected would be the maximum value because all of the values are smaller than that of the current value and the next lowest number would be the maximum.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the optimization of display characteristics.

Regarding claim 14, APA and Morita disclose the apparatus of claim 11. Morita also discloses wherein the source data is modulated to a current data value of the current frame, when the current data value of the current frame is the same as a previous data value of the previous frame (Page 1, paragraph [0012] where it states: "That is, the lookup table 103 is set a value, in advance, so that, when a gray-scale value of an input 1 is equal to a gray-scale of an input 2, the gray-scale value is output as an output 2..." The examiner interprets input 1 and 2 to be the current and previous frame data and that when these values are equal the lookup table is bypassed.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow the display to maintain the current settings when no change has been detected within the system.

Regarding claim 15, APA and Morita disclose the apparatus of claim 11. Morita also disclose wherein the modulator includes: a frame memory for delaying the reduced-bit source data for one frame interval (Figure 1, item 3 and page 2, paragraph [0023]); and a lookup table for comparing the reduced-bit source data of the previous frame with the reduced-bit source data of the current frame to select a preset modulated data in accordance with the result of the comparison (Figure 1, item 4 and page 2, paragraph [0024]. Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for a driving apparatus that could compare a previous and current frame and make an adjustment accordingly.

Regarding claim 16, APA and Morita disclose the apparatus for driving according to claim 15. Morita also discloses wherein the bit converter is connected between the

frame memory and an input terminal of the lookup table (Figure 1, items 1, 3 and 4 where items 1 and 2 make up the bit converter in which item 2 is connected to item 3, the frame memory, and item 2 is also connected to an input terminal of item 4, the lookup table. Since the controller, item 2, is in combination with item 1 to make the bit converter, the bit converter is therefore between items 3 an 4, the frame memory and lookup table.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to allow for the source data to be reduced before it is stored in memory so that it will take up less memory space.

Regarding claim 17, APA and Morita disclose the apparatus for driving according to claim 11. APA and Morita fail to disclose wherein the source data is an 8-bît data, and the reduced-bit source data is a 7-bit data. However, it would have been obvious to "one of ordinary skill" in the art to make the source data 8 bits and the reduced source data 7 bits in order to save memory space by allowing for a smaller lookup table.

5. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' APA, in view of Morita (US 2002/0196221) and further in view of Lee (US 2001/0038372).

Regarding claim 18, APA discloses an apparatus for driving a liquid crystal display, comprising: an input line for receiving n-bit source data, wherein n is a positive integer (Figure 4, Data in); a comparator for determining whether the source data of a current frame is identical in n-k bits to the source data of a previous frame stored in the storage memory (Figure 4, Fn and F_{n-1} and page 5, paragraph [0010], 2nd sentence)

wherein k is a positive integer less than n; APA fails to teach of a storage memory for storing the received source data; and a modulator for registering a first modulated data that has a larger value than a data value of the current frame in accordance with an increase of the data value, and a second modulated data that has a smaller value than the data value of the current frame in accordance with a decrease of the data value, and supplying the source data of the current frame to the liquid crystal display panel, or modulating the source data by using the first and second modulated data in accordance with a judgment result of the comparator. Morita discloses a storage memory for storing the received source data (Figure 1, item 3); and a modulator for registering a first modulated data that has a larger value than a data value of the current frame in accordance with an increase of the data value, and a second modulated data that has a smaller value than the data value of the current frame in accordance with a decrease of the data value (Figure 1, item 4 and page 2, paragraph [0012]), and supplying the source data of the current frame to the liquid crystal display panel, or modulating the source data by using the first and second modulated data in accordance with a judgment result of the comparator (Figure 1, output 2 and page 1, paragraph [0012]). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to create a liquid crystal display driving apparatus that would not cause deterioration in picture quality but would also reduce the memory of the lookup table. APA and Morita fail to disclose an apparatus for driving a liquid crystal display, comprising: a liquid crystal display panel comprising a plurality of data lines, and a plurality of gate lines, wherein the data lines cross the gate lines, and a

liquid crystal cell is formed at a pixel area between a data line and a gate line. Lee discloses an apparatus for driving a liquid crystal display, comprising: a liquid crystal display panel comprising a plurality of data lines (Figure 8, items D1-Dm), and a plurality of gate lines (Figure 8, items S1-Sn), wherein the data lines cross the gate lines (Figure 8), and a liquid crystal cell is formed at a pixel area between a data line and a gate line (Figure 8, item 100). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA, Morita and Lee in order to provide the liquid crystal display panel driving apparatus with all of the elements needed to create a display.

Regarding claim 19, APA, Morita and Lee disclose the apparatus of claim 18. Morita also discloses wherein the comparator supplies the data of the current frame to the liquid crystal display panel when the data value is the same between the previous frame and the current frame (Page 1, paragraph [0012] where it states: "That is, the lookup table 103 is set a value, in advance, so that, when a gray-scale value of an input 1 is equal to a gray-scale of an input 2, the gray-scale value is output as an output 2..."), and supplies the source data of the current frame and the source data of the previous frame to the modulator when the data value is not the same between the previous frame and the current frame (Page 1, paragraph [0012] The examiner interprets the lookup table to be the modulator and comparator such that when the values are equal the source data is provided at output 2 but when they differ the lookup table is used to find an overshooting value). Therefore it would have been obvious to

"one of ordinary skill" in the art to combine the teachings of APA, Morita and Lee in order to create a driving apparatus that will reduce memory and improve picture quality.

Regarding claim 20, APA, Morita and Lee disclose the apparatus of claim 18. Morita also discloses wherein the modulator compares n-k bits of the source data of the current frame with corresponding n-k bits of the source data of the previous frame, wherein k is a positive integer less than n, modulates the source data by using the first modulated data if the source data value is larger in the current frame than in the previous frame, and modulates the source data by using the second modulated data if the source data value is lower in the current frame than in the previous frame. (Page 1, paragraph [0012] where it states: "...however, when a gray-scale value of the input 2 is smaller than a grayscale of the input 1, an output 2 having a gray-scale value being larger than a gray-scale value of an input 2 is output as an overshooting gray-scale value and, when a gray-scale value of an input 2 is larger than a gray-scale value of an input 1, and output 2 having a gray-scale value being smaller than a gray-scale value of the input 2 is output as an overshooting gray-scale value." The examiner interprets this to mean that the output 2 in both cases are the first and second modulated data which are used when the two values are different, being larger or smaller.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA, Morita and Lee in order to create a driving apparatus that will reduce memory and improve picture quality.

Regarding claim 21, APA, Morita and Lee disclose the apparatus of claim 18. Lee discloses of the apparatus further comprising: a data driver for supplying the

modulated data from the modulator to the data line of the liquid crystal display panel (Figure 8, item 300); a gate driver for supplying a scan signal to the gate line of the liquid crystal display panel (Figure 8, item 200); and a timing controller for controlling the data driver and the gate driver (Figure 14, item 430). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA, Morita and Lee in order to provide the liquid crystal display panel driving apparatus with a gate driver to control the gate lines, a data drive to control the data line and a timing controller to synchronize the display device such that the apparatus would contain the elements need to create a display.

Regarding claim 22, APA, Morita and Lee disclose the apparatus of claim 21. Lee also discloses wherein the modulator is a lookup table integrated into the timing controller (Figure 14, item 400 is the modulator, item 462 is the lookup table and the timing controller is item 430). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA, Morita and Lee in order to provide a modulator that had the controller and lookup table integrated together to allow for easier synchronization of the apparatus.

Regarding claim 23, APA, Morita and Lee disclose the apparatus, of claim 18. Morita also discloses wherein n is 8, and k is 1 (Page 2, paragraph [0027]. The examiner interprets this to mean that since the first input is made up of 8 bits such that n=8 and k=1.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of APA and Morita in order to provide a source data that consists of 8 bits.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

9 August 2005

REGINA LIANG
PRIMARY EXAMINER